FIG. 1

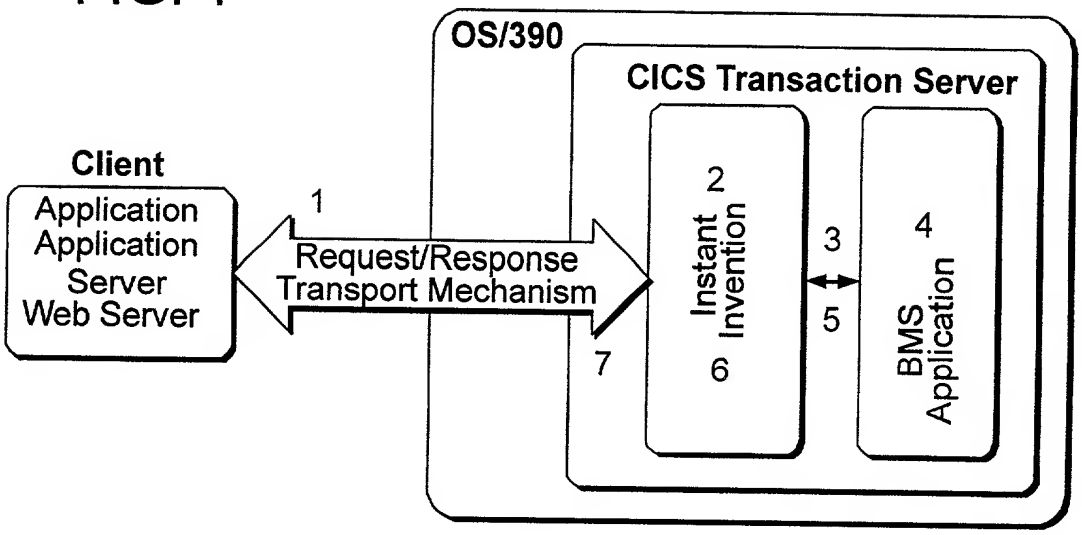

OS/390
CICS Transaction Server
Client
Application
Application
Server
Web Server
1
Request/Response
Transport Mechanism
2
Instant
Invention
3
4
BMS
Application
5
6
7

FIG. 2

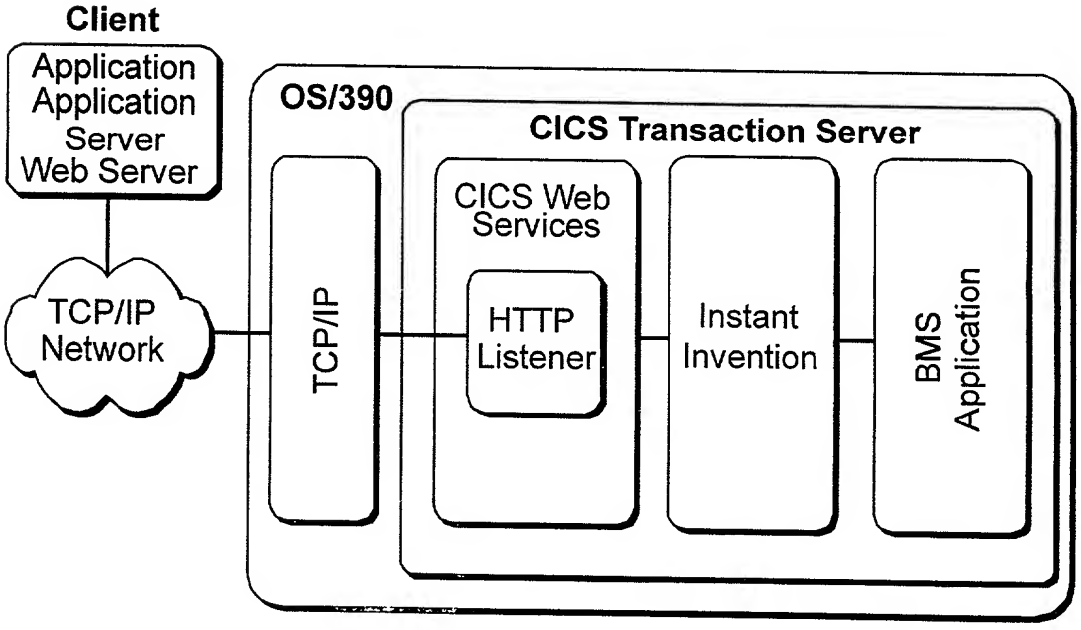

Client
Application
Application
Server
Web Server
TCP/IP
Network
OS/390
CICS Transaction Server
TCP/IP
CICS Web
Services
HTTP
Listener
Instant
Invention
BMS
Application

FIG. 3

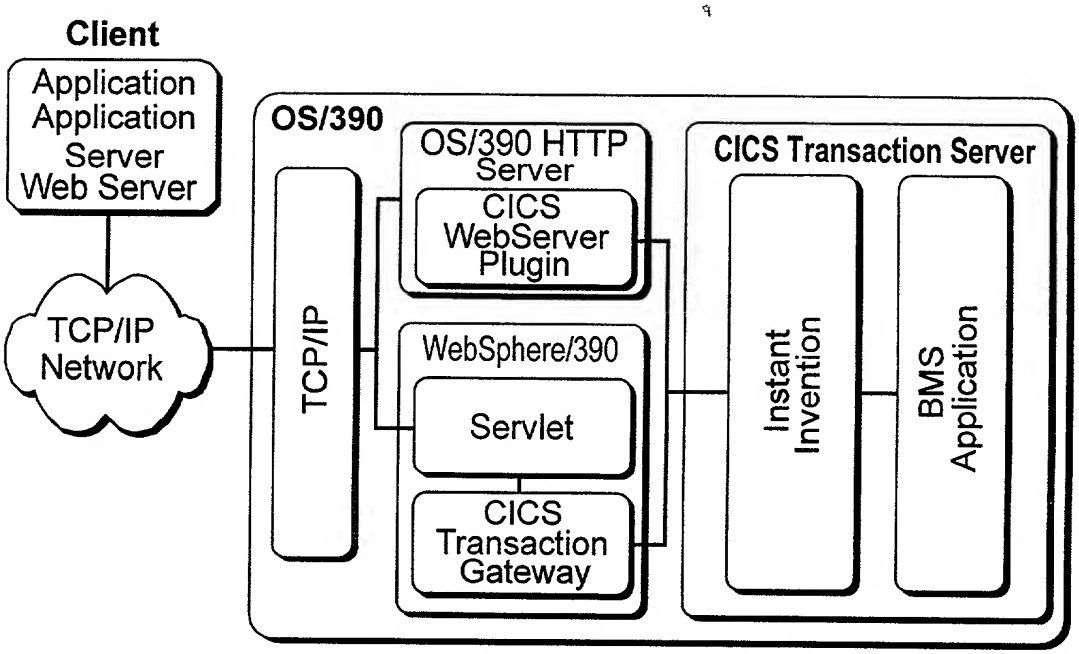

Client
Application
Application
Server
Web Server
TCP/IP
Network
OS/390
TCP/IP
OS/390 HTTP
Server
CICS
WebServer
Plugin
WebSphere/390
Servlet
CICS
Transaction
Gateway
CICS Transaction Server
Instant
Invention
BMS
Application

FIG. 4

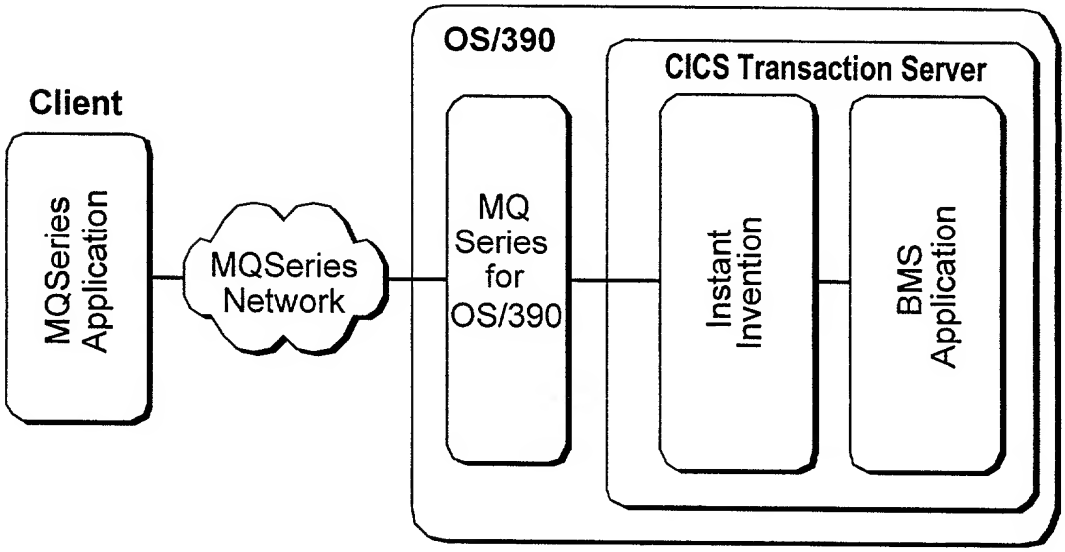

Client
MQSeries
Application
MQSeries
Network
OS/390
MQ
Series
for
OS/390
CICS Transaction Server
Instant
Invention
BMS
Application

FIG. 5

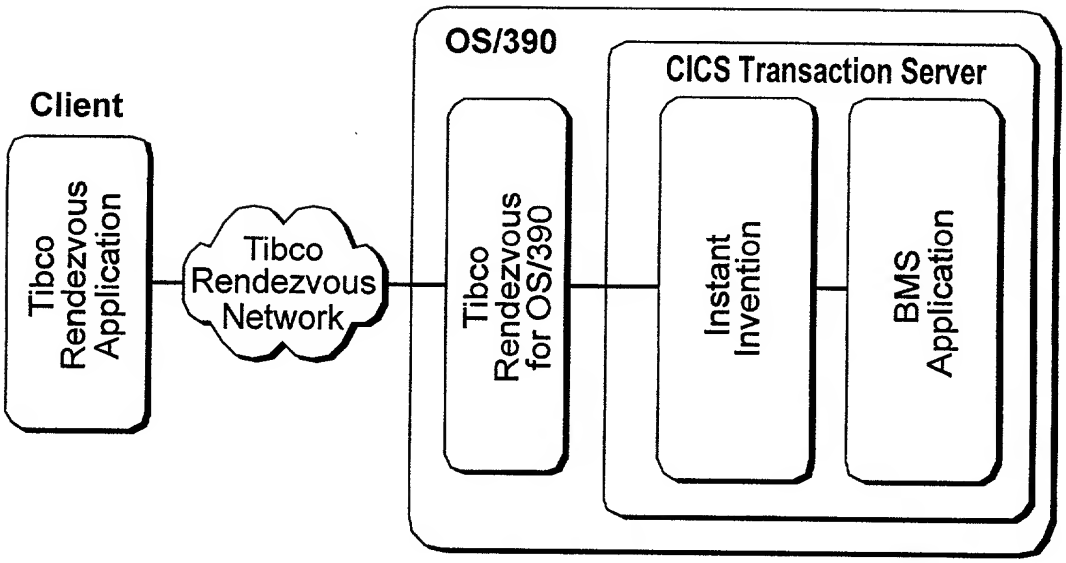

Client
Tibco Rendezvous Application
Tibco Rendezvous Network
OS/390
Tibco Rendezvous for OS/390
CICS Transaction Server
Instant Invention
BMS Application

FIG. 6

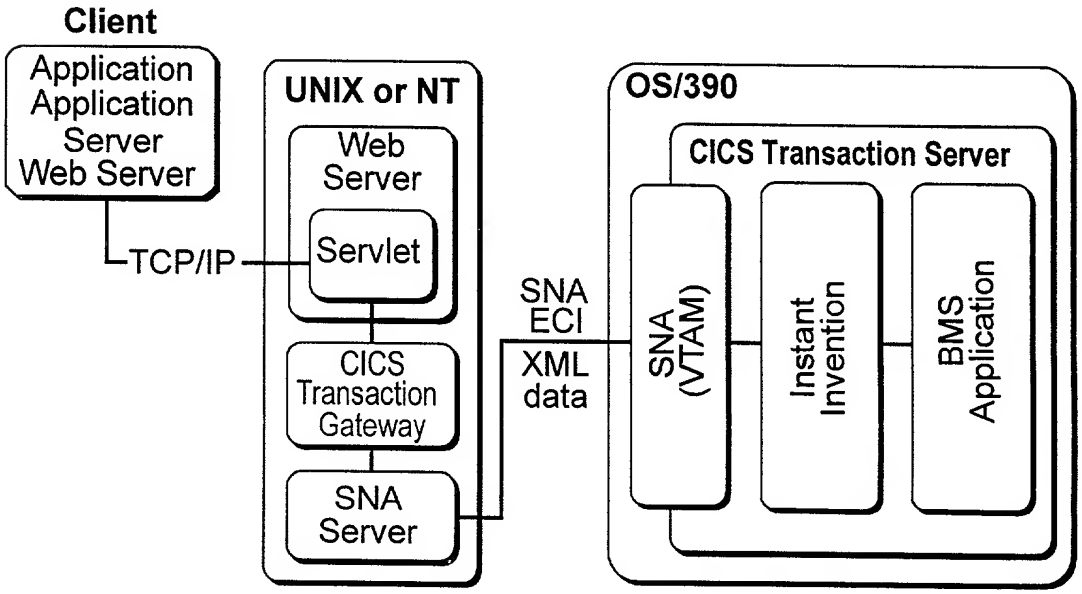

Client
Application Application Server Web Server
TCP/IP
UNIX or NT
Web Server
Servlet
CICS Transaction Gateway
SNA Server
SNA ECI
XML data
OS/390
CICS Transaction Server
SNA (VTAM)
Instant Invention
BMS Application

FIG. 7

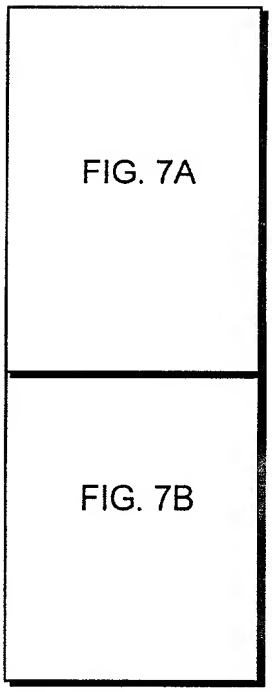


FIG. 8

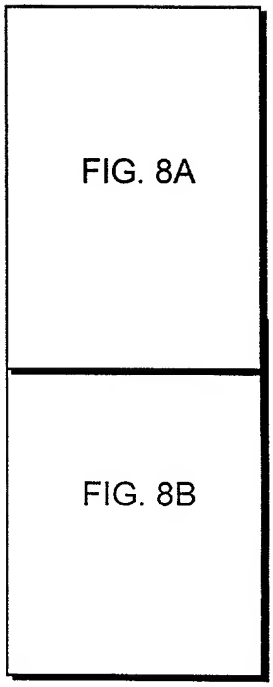


FIG. 7A

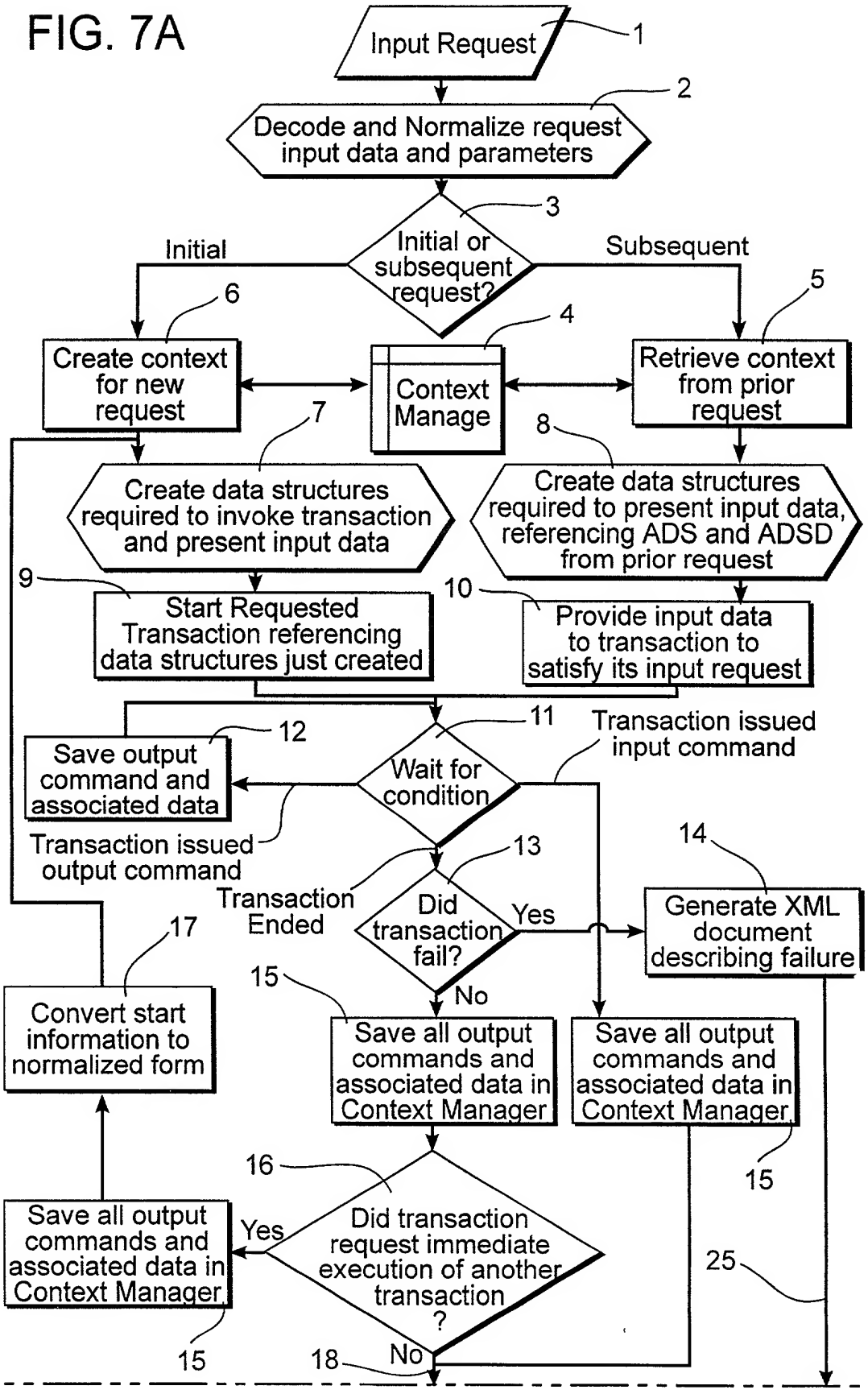

Input Request
1
Decode and Normalize request input data and parameters
2
Initial or subsequent request?
3
Initial
Subsequent
Create context for new request
6
Context Manage
4
Retrieve context from prior request
5
7
Create data structures required to invoke transaction and present input data
8
Create data structures required to present input data, referencing ADS and ADSD from prior request
9
Start Requested Transaction referencing data structures just created
10
Provide input data to transaction to satisfy its input request
11
Transaction issued input command
Wait for condition
12
Save output command and associated data
Transaction issued output command
13
Transaction Ended
Did transaction fail?
Yes
14
Generate XML document describing failure
No
15
Save all output commands and associated data in Context Manager
Save all output commands and associated data in Context Manager
15
17
Convert start information to normalized form
16
Did transaction request immediate execution of another transaction ?
Yes
Save all output commands and associated data in Context Manager
15
No
18
25

FIG. 7B

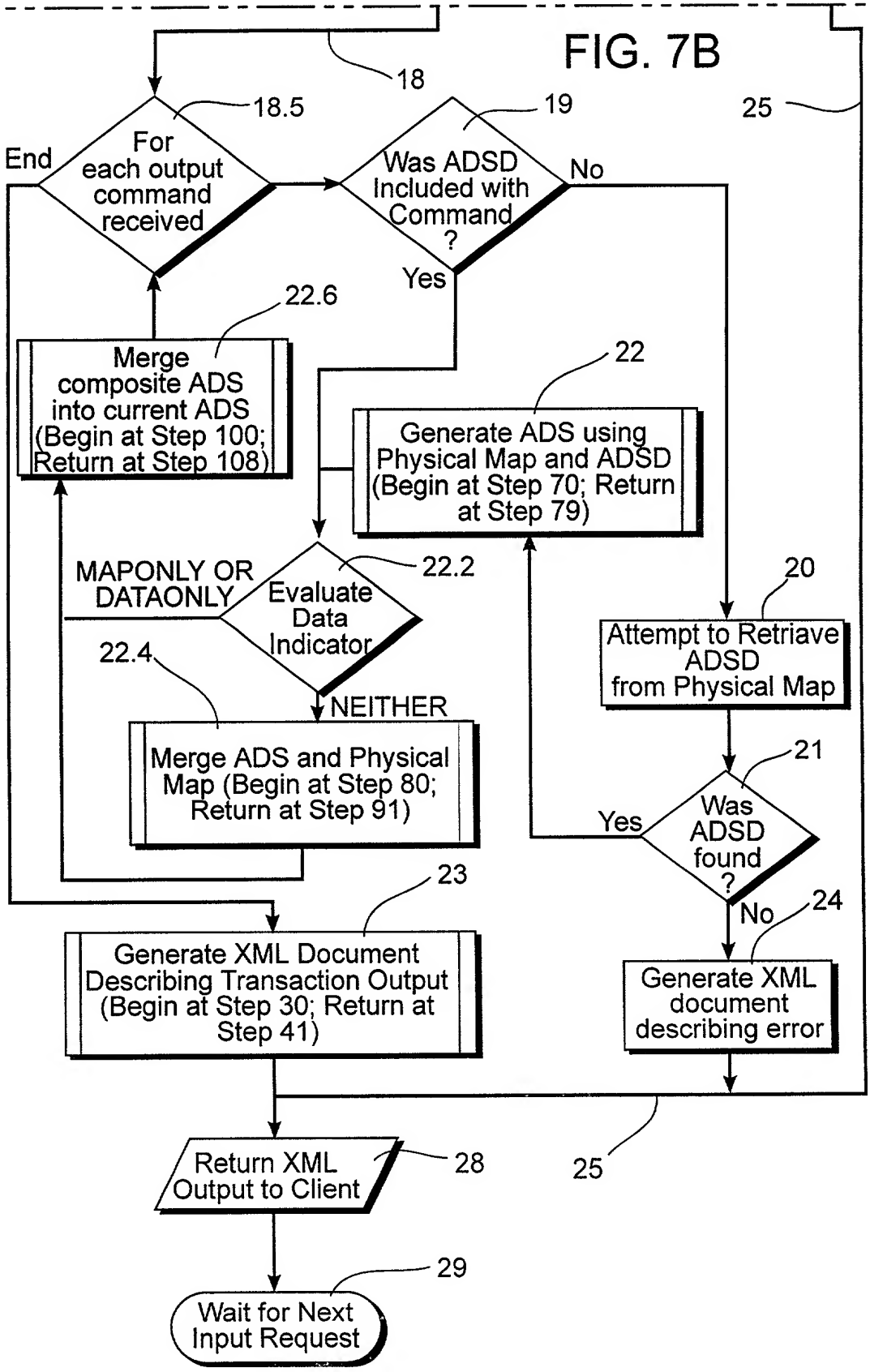

18
18.5
For each output command received
End
19
Was ADSD Included with Command ?
No
Yes
25
22.6
Merge composite ADS into current ADS (Begin at Step 100; Return at Step 108)
22
Generate ADS using Physical Map and ADSD (Begin at Step 70; Return at Step 79)
MAPONLY OR DATAONLY
22.2
Evaluate Data Indicator
NEITHER
22.4
Merge ADS and Physical Map (Begin at Step 80; Return at Step 91)
20
Attempt to Retriave ADSD from Physical Map
21
Was ADSD found ?
Yes
No
24
23
Generate XML Document Describing Transaction Output (Begin at Step 30; Return at Step 41)
Generate XML document describing error
25
Return XML Output to Client
28
29
Wait for Next Input Request

FIG. 8A

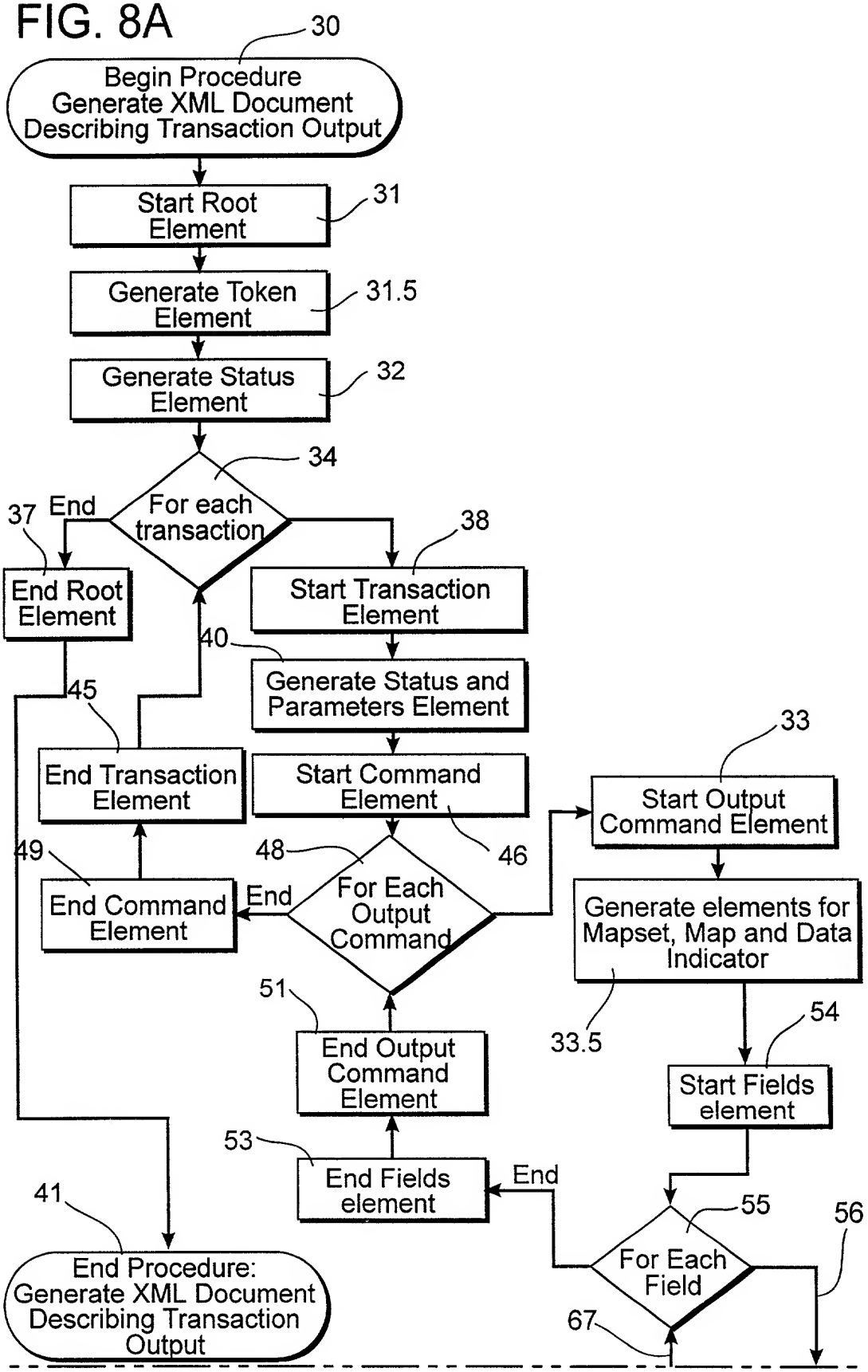

30
Begin Procedure Generate XML Document Describing Transaction Output
Start Root Element
31
Generate Token Element
31.5
Generate Status Element
32
34
For each transaction
End
37
End Root Element
38
Start Transaction Element
40
Generate Status and Parameters Element
45
End Transaction Element
Start Command Element
46
48
For Each Output Command
End
49
End Command Element
33
Start Output Command Element
Generate elements for Mapset, Map and Data Indicator
33.5
54
Start Fields element
51
End Output Command Element
53
End Fields element
End
55
For Each Field
56
67
41
End Procedure: Generate XML Document Describing Transaction Output

FIG. 8B

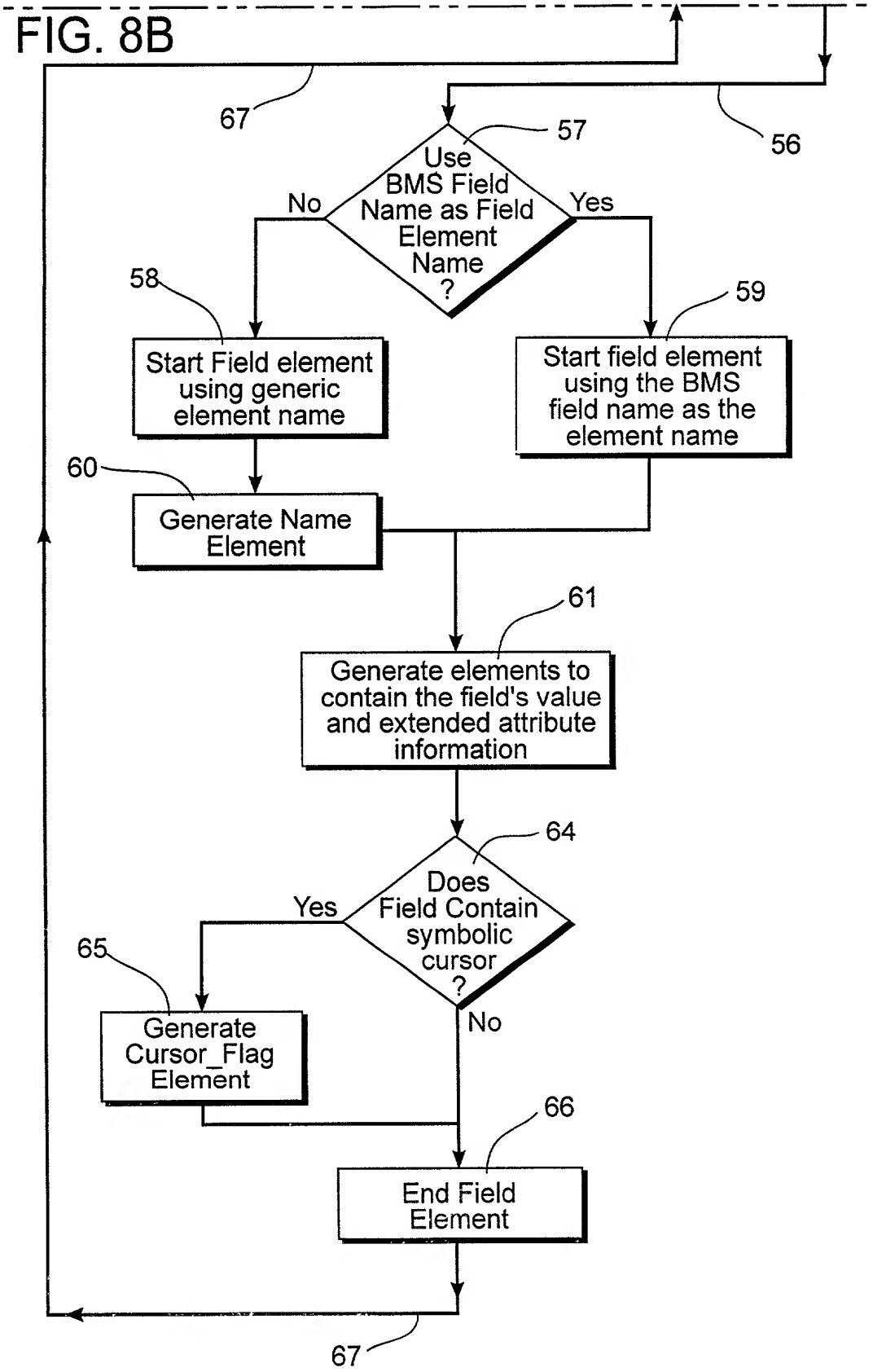

67
57
56
Use BMS Field Name as Field Element Name ?
No
Yes
58
59
Start Field element using generic element name
Start field element using the BMS field name as the element name
60
Generate Name Element
61
Generate elements to contain the field's value and extended attribute information
64
Does Field Contain symbolic cursor ?
Yes
No
65
Generate Cursor_Flag Element
66
End Field Element
67

FIG. 9

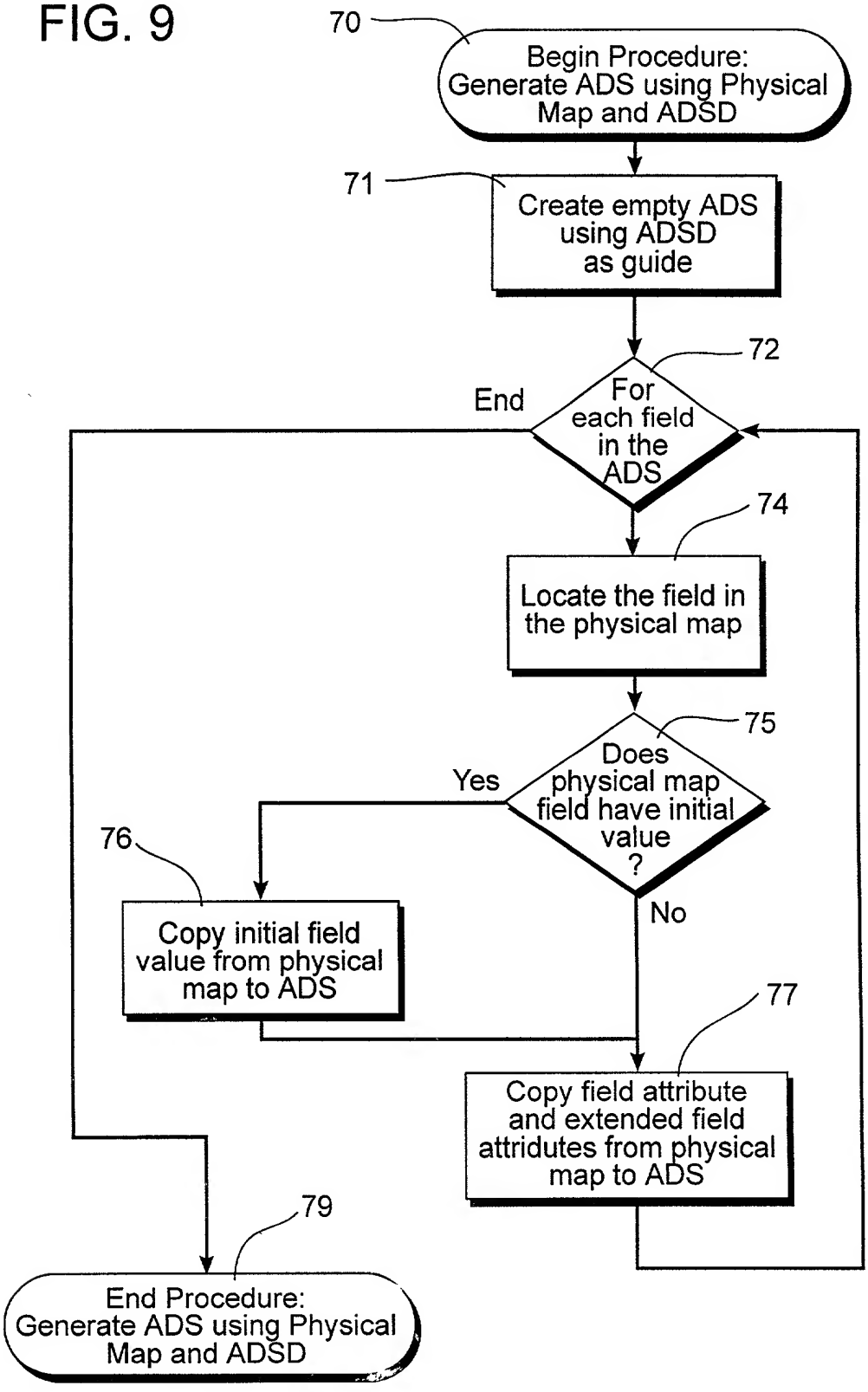

70
Begin Procedure: Generate ADS using Physical Map and ADSD
71
Create empty ADS using ADSD as guide
72
For each field in the ADS
End
74
Locate the field in the physical map
75
Does physical map field have initial value ?
Yes
No
76
Copy initial field value from physical map to ADS
77
Copy field attribute and extended field attridutes from physical map to ADS
79
End Procedure: Generate ADS using Physical Map and ADSD

FIG. 10

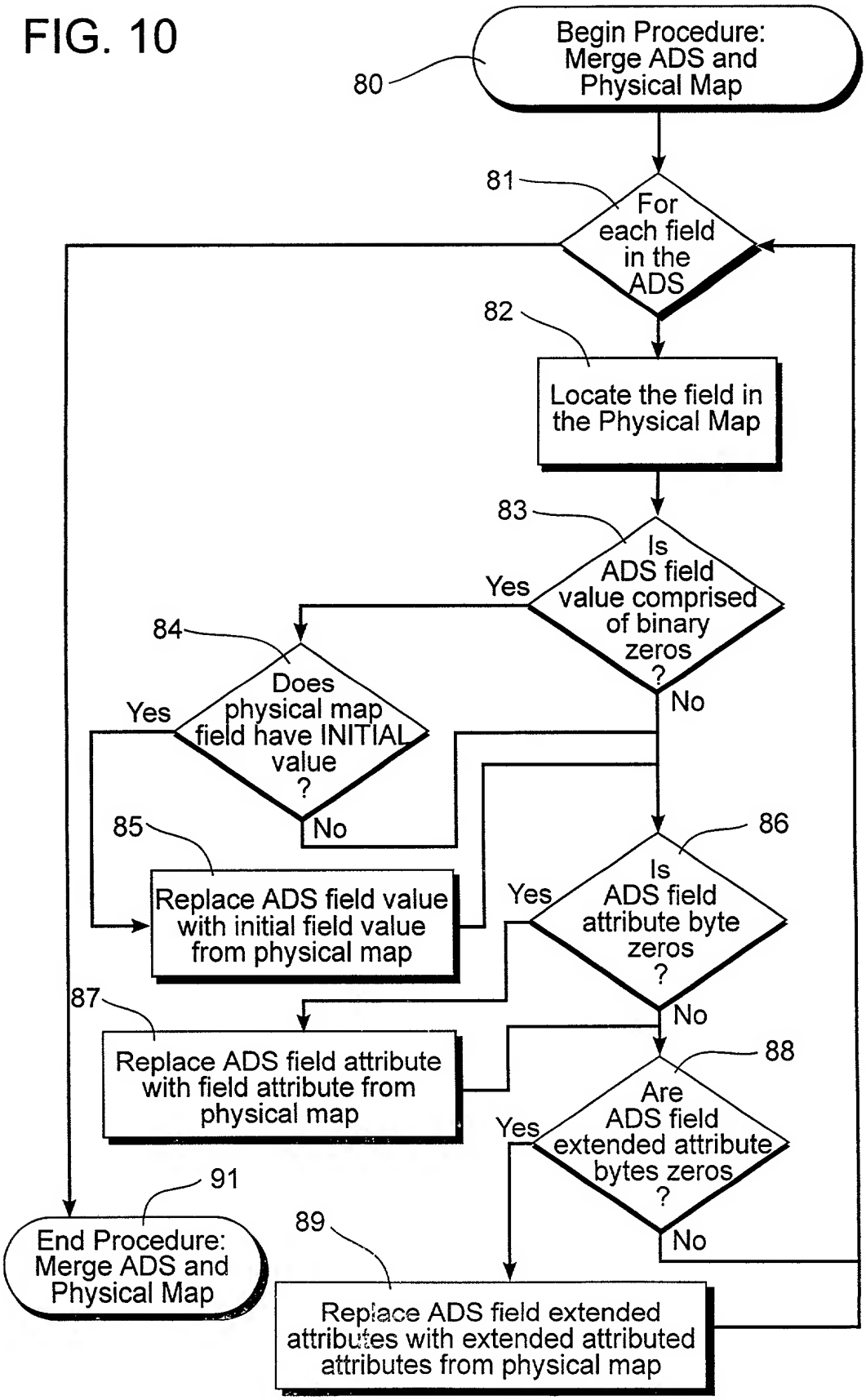

Begin Procedure: Merge ADS and Physical Map
80
81
For each field in the ADS
82
Locate the field in the Physical Map
83
Is ADS field value comprised of binary zeros ?
Yes
No
84
Does physical map field have INITIAL value ?
Yes
No
85
Replace ADS field value with initial field value from physical map
86
Is ADS field attribute byte zeros ?
Yes
No
87
Replace ADS field attribute with field attribute from physical map
88
Are ADS field extended attribute bytes zeros ?
Yes
No
89
Replace ADS field extended attributes with extended attributed attributes from physical map
91
End Procedure: Merge ADS and Physical Map

FIG. 11

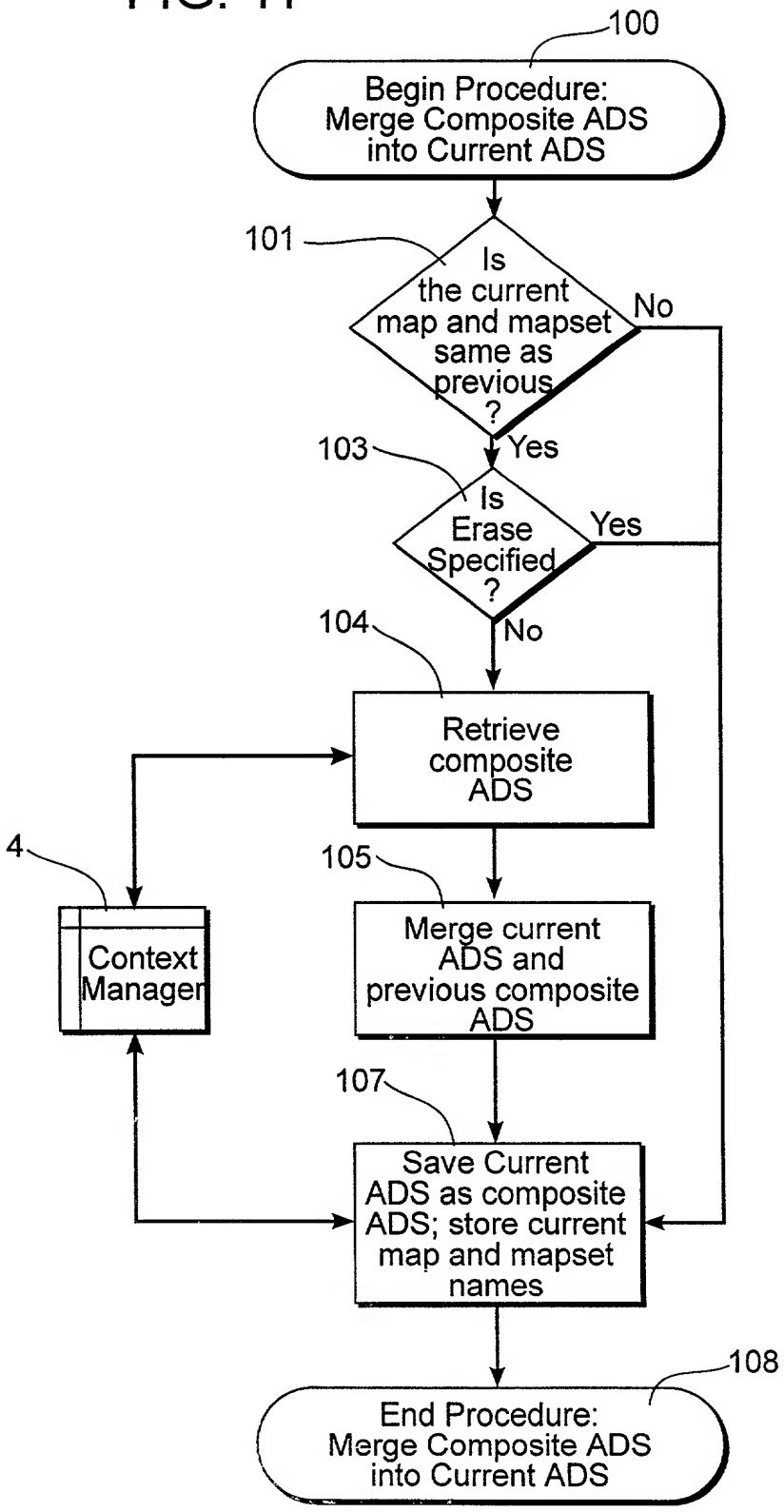

100
Begin Procedure: Merge Composite ADS into Current ADS
101
Is the current map and mapset same as previous ?
No
Yes
103
Is Erase Specified ?
Yes
No
104
Retrieve composite ADS
4
Context Manager
105
Merge current ADS and previous composite ADS
107
Save Current ADS as composite ADS; store current map and mapset names
108
End Procedure: Merge Composite ADS into Current ADS

FIG. 12

```
trad
```

Terminal Input 1 -- Specify Transaction Name

FIG. 13

```
Share Trading Demonstration                TRADER.T002
    Share Trading Manager: Company Selection

                1. Casey_Import_Export
                2. Glass_and_Luget_Plc
                3. Headworth_Electrical
                4. IBM



    Please select a company (1,2,3 or 4) :




--------------------------------------------------------
PF3=Exit                                      PF12=Exit
```

Terminal Output 1 -- Company Selection Screen

FIG. 14

```
    Share Trading Demonstration    TRADER.T002
  Share Trading Manager: Company Selection

                1. Casey_Import_Export
                2. Glass_and_Luget_Plc
                3. Headworth_Electrical
                4. IBM



  Please select a company (1,2,3 or 4) :  1



-----------------------------------------------
PF3=Exit                                PF12=Exit
```

Terminal Input 2 -- Select Company

FIG. 15

```
    Share Trading Demonstration    TRADER.T003

         Share Trading Manager: Options

              1. New Real-Time Quote

              2. Buy Shares

              3. Sell Shares



       Please select a company (1,2 or 3):


-----------------------------------------------
PF3=Return                              PF12=Exit
```

Terminal Output 2 -- Option Selection Screen

FIG. 16

```
     Share Trading Demonstration    TRADER.T003

          Share Trading Manager: Options

                1. New Real-Time Quote

                2. Buy Shares

                3. Sell Shares


    Please select a company (1,2 or 3):  1


-----------------------------------------------
PF3=Return                                PF12=Exit
```

Terminal Input 3 -- Select Company

FIG. 17

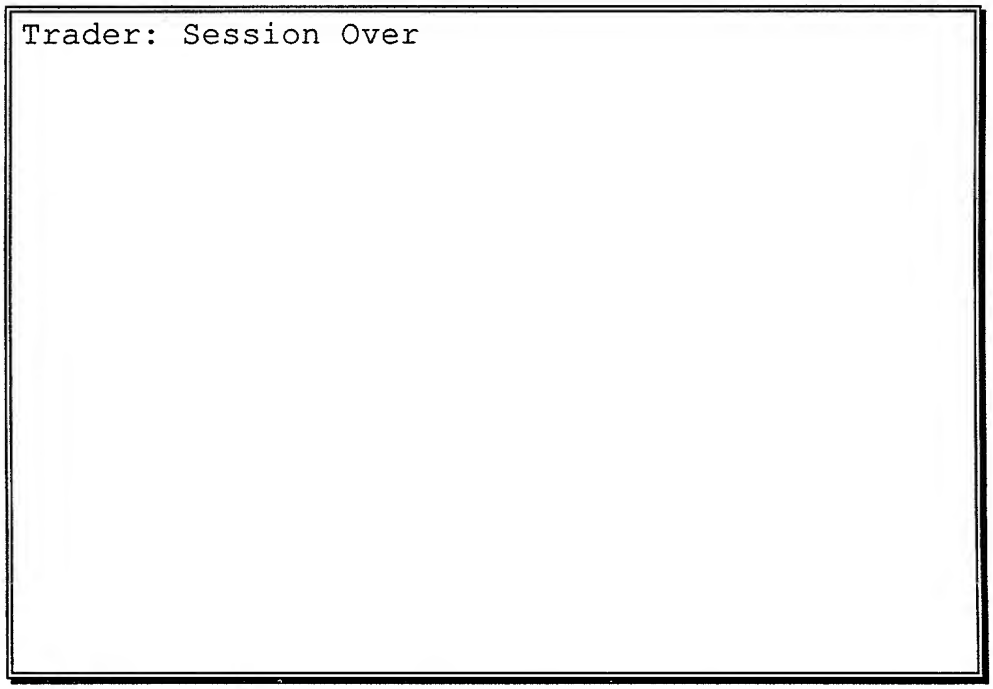
```
     Share Trading Demonstration    TRADER.T004
      Share Trading Manager: Real-Time Quote
 User Name:      RUSS
 Company Name:  Casey_Import_Export

Share Values:              Commission Cost:
 NOW:         00079.00         for Selling:     007
 1 week ago: 00059.00          for Buying:      010
 6 days ago: 00063.00
 5 days ago: 00065.00
 4 days ago: 00070.00
 3 days ago: 00072.00
 2 days ago: 00078.00   Number of Shares Held: 5693
 1 day ago:  00077.00   Value of Shares Held: 000449747.00

Request Completed OK
-----------------------------------------------
PF3=Return                                PF12=Exit
```

Terminal Output 3 – Stock Quote Screen

FIG. 18



Terminal Output 4 -- Session Termination Screen

FIG. 19

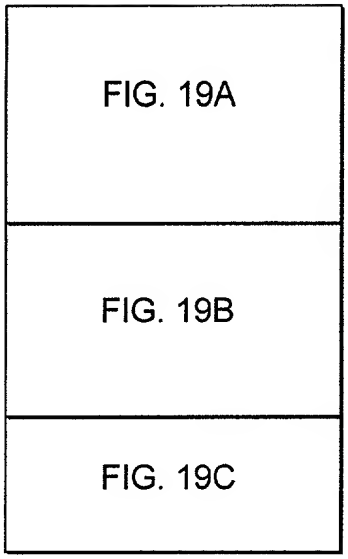


FIG. 20

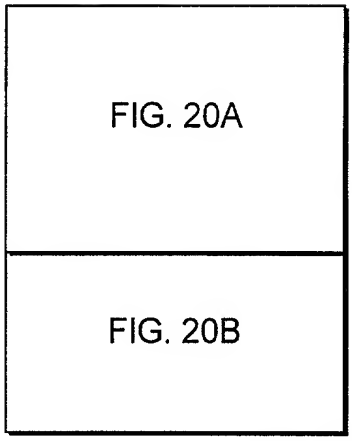


FIG. 21

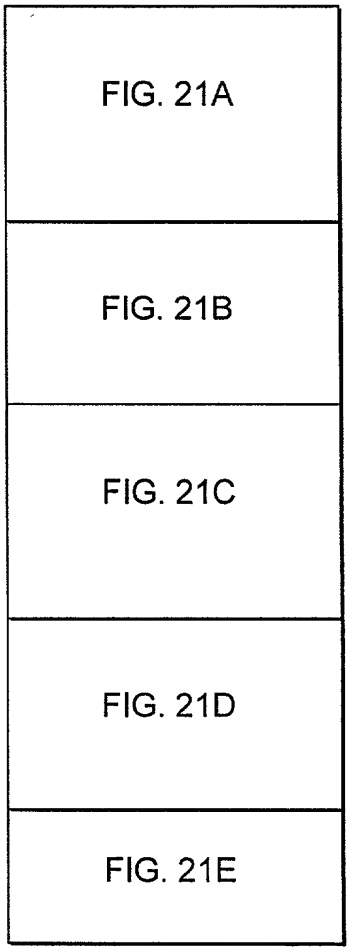


FIG. 19A **XML Response 1 -- Company Selection Document**

```
<?xml version="1.0" encoding="ISO-8859-1" standalone="yes"?>
<request>
    <token>ca445fb5</token>
    <timestamp>20020113025852</timestamp>
    <status>
      <response>0</response>
      <desc>ok</desc>
    </status>
    <transaction tranid="TRAD" facility="}AAB" next_tranid="TRAD"
    next_tranid_src="normal">
      <status>
        <cics_resp>0</cics_resp>
        <cics_resp2>0</cics_resp2>
        <cics_desc>NORMAL</cics_desc>
        <task_end>endtask</task_end>
        <abend_code>    </abend_code>
      </status>
      <parameters>
        <tranid>TRAD</tranid>
        <entry>TRAD</entry>
        <userid>DSI1    </userid>
      </parameters>
      <command src="TRADERPL">
        <send_map erase="y" erase_unp="n" unlock_kb="y" alarm="n" reset_mdt="n" >
          <mapset>TRADBMS </mapset>
          <map>T002    </map>
          <data_indicator>map_and_data</data_indicator>
          <fields count="6">
            <field name="COMP1" index="0">
              <name len="5">COMP1</name>
```

FIG. 19B **XML Response 1 -- Company Selection Document**

```
    <value maxlen="20" len="19">Casey_Import_Export</value>
    <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
    mdt="n"/>
  </field>
  <field name="COMP2" index="0">
    <name len="5">COMP2</name>
    <value maxlen="20" len="19">Glass_and_Luget_Plc</value>
    <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
    mdt="n"/>
  </field>
  <field name="COMP3" index="0">
    <name len="5">COMP3</name>
    <value maxlen="20" len="20">Headworth_Electrical</value>
    <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
    mdt="n"/>
  </field>
  <field name="COMP4" index="0">
    <name len="5">COMP4</name>
    <value maxlen="20" len="3">IBM</value>
    <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
    mdt="n"/>
  </field>
  <field name="OPTION" index="0">
    <name len="6">OPTION</name>
    <value maxlen="1" len="0"></value>
    <attr byte="50" justify="l" disp="y" prot="n" num="y" int="n"
    mdt="n"/>
  </field>
  <field name="MESS2" index="0">
    <name len="5">MESS2</name>
```

FIG. 19C **XML Response 1 -- Company Selection Document**

```
                <value maxlen="79" len="0"></value>
                <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
                mdt="n"/>
              </field>
            </fields>
            <cursor type="none"/>
          </send_map>
        </command>
      </transaction>
</request>
```

FIG. 20A **XML Response 2 -- Option Selection Document**

```
<?xml version="1.0" encoding="ISO-8859-1" standalone="yes"?>
<request>
    <token>ca445fb5</token>
    <timestamp>20020113025955</timestamp>
    <status>
      <response>0</response>
      <desc>ok</desc>
    </status>
    <transaction tranid="TRAD" facility="}AAB" next_tranid="TRAD"
    next_tranid_src="normal">
      <status>
        <cics_resp>0</cics_resp>
        <cics_resp2>0</cics_resp2>
        <cics_desc>NORMAL</cics_desc>
        <task_end>endtask</task_end>
        <abend_code>    </abend_code>
      </status>
      <parameters>
        <tranid>TRAD</tranid>
        <entry>TRAD</entry>
        <userid>DSI1    </userid>
      </parameters>
      <command src="TRADERPL">
        <send_map erase="y" erase_unp="n" unlock_kb="y" alarm="n" reset_mdt="n" >
          <mapset>TRADBMS </mapset>
          <map>T003   </map>
```

FIG. 20B **XML Response 2 -- Option Selection Document**

```
          <data_indicator>map_and_data</data_indicator>
          <fields count="2">
            <field name="OPT2" index="0">
              <name len="4">OPT2</name>
              <value maxlen="1" len="0"></value>
              <attr byte="50" justify="l" disp="y" prot="n" num="y" int="n"
              mdt="n"/>
            </field>
            <field name="MESS3" index="0">
              <name len="5">MESS3</name>
              <value maxlen="79" len="0"></value>
              <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
              mdt="n"/>
            </field>
          </fields>
          <cursor type="none"/>
        </send_map>
      </command>
    </transaction>
</request>
```

FIG. 21A **XML Response 3 -- Stock Quote Document**

```
<?xml version="1.0" encoding="ISO-8859-1" standalone="yes"?>
<request>
    <token>ca445fb5</token>
    <timestamp>20020113030019</timestamp>
    <status>
      <response>0</response>
      <desc>ok</desc>
    </status>
    <transaction tranid="TRAD" facility="}AAB" next_tranid="TRAD"
    next_tranid_src="normal">
      <status>
        <cics_resp>0</cics_resp>
        <cics_resp2>0</cics_resp2>
        <cics_desc>NORMAL</cics_desc>
        <task_end>endtask</task_end>
        <abend_code>    </abend_code>
      </status>
      <parameters>
        <tranid>TRAD</tranid>
        <entry>TRAD</entry>
        <userid>DSI1    </userid>
      </parameters>
      <command src="TRADERPL">
        <send_map erase="y" erase_unp="n" unlock_kb="y" alarm="n" reset_mdt="n" >
          <mapset>TRADBMS </mapset>
          <map>T004   </map>
```

FIG. 21B **XML Response 3 -- Stock Quote Document**

```
<data_indicator>map_and_data</data_indicator>
<fields count="15">
  <field name="USER41" index="0">
    <name len="6">USER41</name>
    <value maxlen="20" len="4">RUSS</value>
    <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
    mdt="n"/>
  </field>
  <field name="COMP41" index="0">
    <name len="6">COMP41</name>
    <value maxlen="20" len="19">Casey_Import_Export</value>
    <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
    mdt="n"/>
  </field>
  <field name="SHRNOW" index="0">
    <name len="6">SHRNOW</name>
      <value maxlen="8" len="8">00079.00</value>
    <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
    mdt="n"/>
  </field>
  <field name="SELL" index="0">
    <name len="4">SELL</name>
    <value maxlen="12" len="3">007</value>
    <attr byte="f0" justify="l" disp="y" prot="y" num="y" int="n"
    mdt="n"/>
  </field>
```

FIG. 21C **XML Response 3 -- Stock Quote Document**

```
<field name="SHARE7" index="0">
  <name len="6">SHARE7</name>
  <value maxlen="8" len="8">00059.00</value>
  <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
  mdt="n"/>
</field>
<field name="SHARE6" index="0">
  <name len="6">SHARE6</name>
  <value maxlen="8" len="8">00063.00</value>
  <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
  mdt="n"/>
</field>
<field name="BUY" index="0">
  <name len="3">BUY</name>
  <value maxlen="12" len="3">010</value>
  <attr byte="f0" justify="l" disp="y" prot="y" num="y" int="n"
  mdt="n"/>
</field><field name="SHARE5" index="0">
  <name len="6">SHARE5</name>
  <value maxlen="8" len="8">00065.00</value>
  <attr byte="f0" justify="l" disp="y" prot="y" num="y" int="n"
  mdt="n"/>
</field>
<field name="SHARE4" index="0">
  <name len="6">SHARE4</name>
  <value maxlen="8" len="8">00070.00</value>
```

FIG. 21D **XML Response 3 -- Stock Quote Document**

```
    <attr byte="f0" justify="l" disp="y" prot="y" num="y" int="n"
    mdt="n"/>
  </field>
  <field name="SHARE3" index="0">
    <name len="6">SHARE3</name>
    <value maxlen="8" len="8">00072.00</value>
    <attr byte="f0" justify="l" disp="y" prot="y" num="y" int="n"
    mdt="n"/>
  </field>
  <field name="SHARE2" index="0">
    <name len="6">SHARE2</name>
    <value maxlen="8" len="8">00078.00</value>
    <attr byte="f0" justify="l" disp="y" prot="y" num="y" int="n"
    mdt="n"/>
  </field>
  <field name="HELD" index="0">
    <name len="4">HELD</name>
    <value maxlen="12" len="4">5693</value>
    <attr byte="f0" justify="l" disp="y" prot="y" num="y" int="n"
    mdt="n"/>
  </field>
  <field name="SHARE1" index="0">
    <name len="6">SHARE1</name>
    <value maxlen="8" len="8">00077.00</value>
    <attr byte="f0" justify="l" disp="y" prot="y" num="y" int="n"
    mdt="n"/>
```

FIG. 21E **XML Response 3 -- Stock Quote Document**

```
            </field>
            <field name="VALUE" index="0">
              <name len="5">VALUE</name>
              <value maxlen="12" len="12">000449747.00</value>
              <attr byte="f0" justify="r" disp="y" prot="y" num="y" int="n"
              mdt="n"/>
            </field>
            <field name="MESS4" index="0">
              <name len="5">MESS4</name>
              <value maxlen="79" len="20">Request Completed OK</value>
              <attr byte="60" justify="l" disp="y" prot="y" num="n" int="n"
              mdt="n"/>
            </field>
          </fields>
          <cursor type="none"/>
        </send_map>
      </command>
    </transaction>
</request>
```

FIG. 22 **XML Output 4 -- Transaction Termination Document**

```
<?xml version="1.0" encoding="ISO-8859-1" standalone="yes"?>
<request>
     <token></token>
     <timestamp>20020113030037</timestamp>
     <status>
       <response>0</response>
       <desc>ok</desc>
     </status>
     <transaction tranid="TRAD" facility="}AAB" next_tranid="     " next_tranid_src="     ">
       <status>
         <cics_resp>0</cics_resp>
         <cics_resp2>0</cics_resp2>
         <cics_desc>NORMAL</cics_desc>
         <task_end>endtask</task_end>
         <abend_code>     </abend_code>
       </status>
       <parameters>
         <tranid>TRAD</tranid>
         <entry>TRAD</entry>
         <userid>DSI1     </userid>
         <aid>PF12</aid>
       </parameters>
       <command src="TRADERPL">
         <send erase="n">
           <data len="20">Trader: Session Over</data>
         </send>
       </command>
     </transaction>
</request>
```